

REMARKS

In the Office Action dated November 1, 2006, claims 1-3, 6, 9, 10, 16, 17 and 21 were rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over U.S. Patent No. 6,850,276 (“Dobusch et al.”) in view of U.S. Patent No. 6,275,259 (“Gowda et al.”). Furthermore, claims 4, 5, 7, 8, 11-15 and 18-20 were rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Dobusch et al. and Gowda et al. in view of U.S. Patent No. 6,587,144 (“Kim”) or U.S. Patent No. 6,654,054 (“Embler”).

In response, Applicant respectfully asserts that the Office Action has failed to establish a *prima facie* case of obviousness for the pending claims 1-21. In particular, the independent claims 1, 9 and 17 are not obvious in view the cited references of Dobusch et al. and Gowda et al. because there is no suggestion or motivation to combine the reference teachings in the manner suggested by the Office Action. Thus, Applicant respectfully requests that the independent claims 1, 9 and 17, as well as the dependent claims 2-8, 11-16 and 18-21, be allowed.

A. Patentability of Independent Claims 1, 9 and 17

The Office Action has rejected the independent claims 1, 9 and 17 under 35 U.S.C. §103(a) as allegedly being unpatentable over Dobusch et al. in view of Gowda et al. However, the Office Action has failed to establish a *prima facie* case of obviousness for the independent claims 1, 9 and 17 because there is no suggestion or motivation to combine the reference teachings, as asserted in the Office Action.

The independent claim 1 recites:

“A method of correcting erroneous image signals comprising:

providing a high signal and a low signal based on an image signal of a previously processed pixel, said image signal of said previously processed pixel being an image signal from a set of image signals that represents a single captured image of a scene of interest, said high signal and said low signal defining a signal range about said image signal of said previously processed pixel; and

digitizing an analog signal of a current pixel using said high and low signals as references to derive a digitized signal of said current pixel within said signal range, including limiting said analog signal of said current pixel by

said high and low signals, said analog signal of said current pixel being another image signal from said set of image signals.”

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

The Office Action on page 3 admits that the cited reference of Dobusch et al. “teaches providing gain $V(x-1)$ that is based on the preceding sensor element $P(x-1)$ is used for the following sensor element $P(x)$ but fails to teach providing a high signal and a low signal based on an image signal of a previously processed pixel.” However, the Office Action further states that the cited reference of Gowda et al. “teaches providing a high signal and a low signal (V_{max} and V_{min}) based on an image signal of a previously processed pixel.” The Office Action then asserts that “it would be obvious to one skilled in the art at the time of the invention to have been motivated to have a high signal and a low signal based on an image signal of a previously processed pixel into the system of Dobusch as taught in Gowda in order to use the full dynamic range of the A/D converter thereby avoiding the overflow and underflow conditions as taught in Gowda.” Applicant respectfully disagrees with the above assertion.

The cited reference of Dobusch et al. discloses a detection system for detecting brightness signals $U(x)$ from a multiplicity ($x:=1\dots n$) of light-sensitive sensor elements $P(1)\dots P(x)$, in particular of a CCD line, as described in column 2, lines 30-33. The detection system of Dobusch et al. includes an adjustable amplifier 2 and an A/D converter 3, as well as other elements. The adjustable amplifier 2 amplifies each brightness signal from one of the sensor elements $P(1)\dots P(x)$ by a gain factor of v . The brightness signals $U(x)$ are read out one after another, as described in

column 2, lines 33-40. The A/D converter 3 generates from the output of the amplifier 2 a digital brightness signal. The gain factor of v appears to be adjusted as needed by the control unit 4 and the evaluator 5 of the detection system of Dobusch et al.

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The cited reference of Gowda et al. discloses an automatic gain control circuit 100, which uses V_{max} and V_{min} values on an analog-to-digital converter (ADC) 104, as illustrated in Fig. 1 and described in column 2, lines 30-39. The V_{max} and V_{min} values are derived using output values of a previous frame to convert analog electrical signal outputs of the current frame to corresponding digital values, as described in described in column 2, lines 47-67, and column 3, lines 1-20. Thus, the automatic gain control circuit 100 of Gowda et al. operates at a frame level, not at a pixel level, i.e., not the level of individual sensor elements.

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First, there is no suggestion or motivation to combine the teachings of Dobusch et al. and Gowda et al. because the detection system of Dobusch et al. and the automatic gain control circuit of Gowda et al. operate at different levels. The detection system of Dobusch et al. operates on signals of individual sensor elements. In contrast, the automatic gain control circuit of Gowda et al. operates on frames of an image. Thus, one of ordinary skill in the art would not have been motivated to include the teachings of Gowda et al. regarding the V_{max} and V_{min} signals, which are used on frames of an image, into the detection system of Dobusch et al., which uses a variable gain factor on signals from individual sensor elements.

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Second, there is no suggestion or motivation to combine the teachings of Dobusch et al. and Gowda et al. because the teachings of Gowda et al. regarding the V_{max} and V_{min} signals cannot be used in the detection system of Dobusch et al. The V_{max} and V_{min} signals of Gowda et al. are used as reference signals for the ADC 104, which has inputs for the V_{max} and V_{min} signals and other inputs for electrical signals from an image sensor 102. The A/D converter 3 of the detection system of Dobusch et al. has only a single input for a brightness signal from a sensor element. Thus, there is no way of using the V_{max} and V_{min} signals of Gowda et al. with the detection system of Dobusch et al. without completely modifying the detection system

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of Dobusch et al., including components related to the variable gain factor (e.g., the adjustable amplifier 2, the control unit 4 and the evaluator 5.)

Third, even assuming that the detection system of Dobusch et al. can somehow be modified to use the Vmax and Vmin signals of Gowda et al., there is no suggestion or motivation to do so because the proposed modification would render the detection system of Dobusch et al. unsatisfactory for its intended purpose. If proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984); MPEP 2143.01 V. The intended purpose of the detection system of Dobusch et al. is to selectively reduce the gain of the variable amplifier 3 for signals from individual sensor elements of a CCD line or array based on signals from preceding sensor elements of the CCD line or array. However, the Vmax and Vmin signals of Gowda et al. are used on subsequent frames of an image. Thus, if the detection system of Dobusch et al. is modified to use the Vmax and Vmin signals of Gowda et al., then the modified detection system would not be able to selectively modify signals from individual sensor elements of a CCD line or array based on signals from preceding sensor elements of the same CCD line or array. Consequently, there is no suggestion or motivation to modify the detection system of Dobusch et al. in the manner suggested in the Office Action.

For all the above reasons, Applicant respectfully asserts that the independent claim 1 is not obvious in view of the cited references of Dobusch et al. and Gowda et al., and requests that claim 1 be allowed. The above remarks are also applicable to the independent claims 9 and 17, which include similar limitations. As such, Applicant respectfully asserts that the independent claims 9 and 17 are also not obvious in view of the cited references of Dobusch et al. and Gowda et al., and requests that these claims 9 and 17 be allowed as well.

B. Patentability of Dependent Claim 2-8, 11-16 and 18-21

Each of the dependent claims 2-8, 11-16 and 18-21 depends on one of the amended independent claims 1, 9 and 17. As such, these dependent claims include all

the limitations of their respective base claims. Therefore, Applicant submits that these dependent claims are allowable for at least the same reasons as their respective base claims.

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Applicant respectfully requests reconsideration of the claims in view of the remarks made herein. A notice of allowance is earnestly solicited.


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Respectfully submitted,

Ray Alan Mentzer

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By: 
Thomas H. Harn
Registration No. 43,654
Telephone: (925) 249-1300